UNITED STATES PATENT AND TRADEMARK OFFICE

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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/542,007	BROGARDH, TORGNY
	Examiner	Art Unit	
	Edward R. Cosimano	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>11 July 2005</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-36</u> is/are pending in the application.

    4a) Of the above claim(s) <u>none</u> is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-23 and 25-36</u> is/are rejected.

7)☒ Claim(s) <u>24</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>11 July 2005</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>7/11/2005</u>.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

1.   The Oath/Declaration and replacement Abstract as filed on 11 July 2005 are acceptable to the examiner.

2.   Acknowledgment is made of applicant's claim for foreign priority based on an application number SE 0300409-0 filed in Sweden on 13 February 2003. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

3.   The sheets of drawings filed on 11 July 2005 and containing figures 4, 5, 6, 7, 11, 12, 14, 15a, 15b, 16, 17 & 18 are acceptable to the examiner.

4.   The drawings filed 11 July 2005 are objected to because:

A) the drawings fail to comply with 37 CFR 1.84(n,o) because they contain unlabeled depictions of features of the invention that are not readily recognizable from the depicted symbol. Therefore applicant is required to provide suitable descriptive title legends for the features of the invention designated by:

(1) reference number 3 in figure 1 as described in paragraph located between page 11, line 13, and page 12, line 4, "Fig. 1 shows an example of a manipulator 2, and a **control system 3** for controlling the movements of the robot. The control system ... in relation to the tilt member about a sixth axes.", {emphasis added}; and

(2) reference numbers 16a & 16b in figure 2 as described in paragraph located between page 13, line 23, and page 14, line 6, "Fig. 2 shows a ... providing geometric classification module 16, which comprises a **part classification module 16a**, which determines to which part of the object a particular measuring point belongs, and an **object classification module 16b**, which determines ... which the robot is be moved, in dependence of the correction vectors.", {emphasis added}.

B) the drawings fail to comply with 37 CFR 1.84(p)(5) because they include the following reference legend 62 to designate a line which has not been mentioned in the description of figure 8 located in the paragraph between page 21, line 27, and page 22, line 14, "Fig. 8 shows the compensation ... be compensated for errors in two directions.", note also below regarding the corresponding objection to the disclosure.

C) the drawings fail to comply with 37 CFR 1.84(p)(5) because they include the following reference legend 84 which has not been mentioned in the description of figure 9 located in the paragraph at page 22, lines 15-25, "Fig. 9 shows how a robot path 82, programmed ... either be obtained from neighboring object surfaces, or neighboring edge lines.", note also below regarding the corresponding objection to the disclosure.

D) the drawings fail to comply with 37 CFR 1.84(p)(5) because they do not include the following reference legends 90 & 91 which have not been mentioned in the description of figure 10 located in the paragraph between page 22, line 26, and page 23, line 2, "Fig. 10 shows an alternative ... second object plan. **Path 90 is programmed in the CAD model and path 91 is the compensated path**. As shown ... a smoother path, the positions of the path can be filtered with respect to the path length." {emphasis added}, note also below regarding the corresponding objection to the disclosure.

E) the drawings fail to comply with 37 CFR 1.84(p)(5) because they include the following reference legend 108 which has not been mentioned in the description of figure 13 located in the paragraph at page 26, lines 1-16, "Fig. 13 shows calibration of a tool 104 ... same method can also be used for gripping devices and fixtures, if those exist as CAD models.".

4.1   Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5.   The disclosure is objected to because of the following informalities:

        A) errors and/or inconsistencies between the drawings filed 11 July 2005 and the written description have been noted:

        (1) it is suggested that the paragraph located between page 11, line 13, and page 12, line 4, be amended as follows:

        --Fig. 1 shows an example of a system for programming an industrial robot according to the invention. The system comprises an industrial robot 1, from now on denoted the robot, which comprises a manipulator 2, and a control system 3 for controlling the movements of the robot. The control system comprises a model of the kinematic of the robot. The system further comprises a work object 4, on which the robot is about to perform some kind of process, for example welding, painting or grinding. Further, the system comprises a computer 5, in which the software of the invention is stored, and in which the software is executed. The robot, as shown in the figure, is an industrial robot having six axes, and comprising a base 7 fixedly mounted on a foundation and a stand 8, which is rotateable in relation to the base about a first axis. In the upper end of the stand, a first robot arm 9 is rotateably mounted in relation to the stand about a second axes. In the outer end of the first arm, a second arm 10 is rotateably mounted in relation to the first arm about a third axes. The second robot arm comprises two parts, wherein the outer part is rotateable in a relation to the inner part about a fourth axes. The second arm 10 carries in its outer end a tilt member 11, which is rotateable about a fifth axes. The robot also comprises a tool holder 12, which is rotateable in relation to the tilt member about a sixth axes.--.

        (2) as can be seen in figure 3 and from applicant's consistent use of references to "object 4" the reference to "object 34" at lines 1-2 of paragraph located at page 15, lines 5-11, "Fig. 3 shows some definitions for object classification. The **object 34** has ... on the object are related to the object coordinate system.", {emphasis added}, is confusing and it is noted that the paragraph at page 15, lines 5-11, should be amended as follows:

--Fig. 3 shows some definitions for object classification. The object [[34]] 4 has a plurality of object surfaces 20, and a plurality of edge lines 21. On the object surface there are a plurality of measuring points 22 indicated with cross. In the figure an object coordinate system 23 is shown. The object coordinate system is connected to the object, and all points on the object are related to the object coordinate system.--.

(3) as can be seen in figure 8 and:

(a) from applicant's consistent use of references to "surface 64" the reference to "surface 62"; and

(b) as can be seen in figure 8 reference number 62 is used to designate a line and not to designate an edge line;

at line 6 of paragraph located between page 21, line 27, and page 22, line 14, "Fig. 8 shows the compensation ... a second **object surface 64**, neighboring to the first object surface. An ... the **object surface 62**. The ... in the **object surfaces 40 and 64**. The ... the **object surface 64**, projected on the subsurface ... be compensated for errors in two directions.", {emphasis added}, it is noted that the paragraph located between page 21, line 27, and page 22, line 14, should be amended as follows:

--Fig. 8 shows the compensation of a robot path 60, programmed in the CAD model, where the path is compensated for errors in two directions. In the figure, a first object surface 40 is shown, and a second object surface 64, neighboring to the first object surface. An edge line 65 divides the object surface 40 and the object surface [[62]] 64. The edge line 65 is the intersection between the object surfaces 40 and 64. In the CAD model there is an edge line 66 corresponding to the edge line 65. The edge line 66 in the CAD model is adjusted to be in accordance with a corresponding edge line on the object. The adjusting of the edge line 66 is based on the correction vectors 67 and 68 of neighboring subsurfaces in the object surfaces 40 and 64. The edge line adjusted in such a way is denoted 69 in the figure. The path 60, programmed in the CAD model, is compensated in dependence of the average error in the normal direction of the

subsurface of the objective surface 40, i.e. the correction vector 67, and the average error in the plane of the subsurface given by the aver- age error of the closest subsurface [[o]] of the object surface 64, projected on the subsurface in the object surface 40, i.e. the correction vector 68. In that way the path will be compensated for errors in two directions.--

(4) as can be seen in figure 9 and from the context of the paragraph located at page 22, lines 15-25, "Fig. 9 shows how a robot path 82, programmed ... **edge lines 80** are ... the compensated path 80 is shown, which is compensated for errors in three directions. The correction vectors can either be obtained from neighboring object surfaces, or neighboring edge lines.", {emphasis added}, it appears that paragraph at page 22, lines 15-25, should be amended as follows:

--Fig. 9 shows how a robot path 82, programmed in the CAD model, is compensated for errors in three directions. An edge line 76 is calculated as the intersection between the object surface 40 and an object surface 74. An edge line 78 is calculated as the intersection between the object surface 40 and the object surface 64. Adjusted edge lines 80 are calculated in dependence of the correction vectors of neighboring subsurfaces in the object surfaces 40, 64 and 74. In the figure, the compensated path [[80]] 84 is shown, which is compensated for errors in three directions. The correction vectors can either be obtained from neighboring object surfaces, or neighboring edge lines.--.

(5) if applicant chooses not to add reference numbers 90 & 91 to figure 10, note above, then the specification fails to comply with 37 CFR 1.84(p)(5) because the specification includes an explicit reference to these reference legends in the description of figure 10 located in the paragraph between page 22, line 26, and page 23, line 2, "Fig. 10 shows an alternative ... second object plan. **Path 90 is programmed in the CAD model and path 91 is the compensated path.** As shown ... a smoother path, the positions of the path can be filtered with respect to the path length." {emphasis added}.

(6) if applicant chooses not to delete reference number 108 from figure 13, note above, then the specification fails to comply with 37 CFR 1.84(p)(5) because

the specification does not include an explicit reference to this reference legend in the description of figure 13 located in the paragraph at page 26, lines 1-16, "Fig. 13 shows calibration of a tool 104 by means of a ... same method can also be used for gripping devices and fixtures, if those exist as CAD models.".

B) the disclosure lacks a statement of –I claim:--, as required by Office policy as set forth in MPEP 608.01(m).

5.1   Appropriate correction is required.

6.   How Claims are to be interpreted during the prosecution of an application for patent.

6.1   The pending claims are interpreted by giving the language of every positively recited limitation of the pending claims the broadest reasonable interpretation that is consistent with how one of ordinary skill at the time of the invention would have interpreted the language of the claims, In re Cortright, 165 F.3d 1353, 1359, 49 USPQ2d 1464, 1468 (Fed. Cir. 1999), while (1) taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in applicant's specification, In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997), and (2) without reading unrecited limitations from applicant's disclosure in to the claims, see In re PRATER AND WEI, 162 USPQ 541 at 551 (CCPA 1969) "We are not persuaded by any sound reason why, at any time before the patent is granted, an applicant should have limitations of the specification read into a claim where no express statement of the limitation is included in the claim.", In re PRATER AND WEI, 162 USPQ 541 at 551 (CCPA 1969).

6.1.1   Further, when interpreting the claims as a whole, then the interactions of claim limitations as a whole must be considered in order to determine the scope of a claim and the applicant's contribution in the art, In re LARSEN, No. 01-1092 (Fed. Cir. May 9, 2001) (unpublished) "The court observed that the totality of all the limitations of the claim and their interaction with each other must be considered to ascertain the inventor's contribution to the art.". Where a statutory process/machine must contain an operative series of acts/functions or structures, In re MUSGRAVE, 167 USPQ 280 at 289-290 (CCPA 1970), with explicitly recite all of the necessary interactions to accomplish the recited utility of the claimed invention, for without these interaction the claim as a whole would not be a proper process/machine under the statue, In re SARKAR 200 USPQ 132 at 136 (CCPA 1978).

6.1.2   In regard to the limitations on the interpretation of the claimed invention as imposed by the Court, it is noted that applicant has gone to great lengths in the written description to describe each of the disclosed means or acts by not describing a specific structure for each of means or a specific act but by describing the means or act by describing the function of each of the means or acts. Hence, it is noted that as set forth by the Court each of the limitations of the claims could be reasonably interpreted by one of ordinary skill at the time of the invention as not being not limited to the corresponding disclosed structure/act but in fact would to be broadly interpreted to include any and all means/structures that would provide the corresponding functions or acts that are recited as the claimed invention.

7.   Claims 1-29 are objected to because of the following informalities.

7.1   In regard to claims 1-18, the claimed invention as recited in this claim is deemed to be incomplete for omitting essential structural/functional cooperative relationships of elements, such omission amounting to a gap between the necessary structural/functional connections. In this regard it is noted that the disclosed and claimed invention recites the utility of providing the function/action of "programming an industrial robot to move relative to defined positions on an object", however the remainder of each of these claims, when taken as a whole, fails to recite that the results of this claimed invention have been or are used to achieve the recited utility. In this regard it is noted that as under stood by one of ordinary skill at the time the invention was made, the limitations of the claims recite:

        A) the claims recite a utility of "programming an industrial robot to move relative to defined positions on an object";

        B) the first step/function/action of claims 1, 17 & 18 is directed to nothing more than providing the function of acquiring/register a number of measurement points on the surface of an object in a co-ordinate system associated with the robot;

        C) the second step/function/action of claims 1, 17 & 18 is directed to nothing more than providing the function of manipulating data/information by determining the "orientation and position" of a model of the object relative to the number of measurement points on the surface of the object so as to map/align/correlate the measured points to the corresponding points on the model;

D) the third step/function/action of claims 1, 17 & 18 is directed to nothing more than providing the function of manipulating data/information by determining the positional error or deviation between the measured points and the corresponding points on the model;

E) the fourth step/function/action of claims 1, 17 & 18 is directed to nothing more than providing the function of manipulating data/information by adjusting one or more "defined positions" based on the determined positional error or deviation between the measured points and the corresponding points on the model; and

F) the subject matter of dependent claims 2-16 is directed to nothing more than merely defining the nature of (1) the type of information/data to be processed by the claimed invention, and/or (2) the type of information/data processing performed by the claimed invention, and/or (3) the structure or device used to make the measurements of the claimed invention, with out associating the subject matter recited in these claims to something that one of ordinary skill at the time the invention was made would recognize as achieving the recited utility of programming an industrial robot to move relative to defined positions on an object.

Where, it is noted that taking the claim as a whole the functions/acts that are recited as the invention do not explicitly or inherently convey to one of ordinary skill at the time of the invention that the claimed machine would fulfill the function of "programming an industrial robot to move relative to defined positions on an object" since these claims fail to required that either the "determined positional errors/deviations" or the adjusted "defined positions" be used to modify the control program for the "industrial robot" in a manner that would be recognized by one of ordinary skill at the time the invention was made as achieving the disclosed and claimed utility of "programming an industrial robot to move relative to defined positions on an object".

7.2   In regard to claims 19-21, 24 & 26-29, the claimed invention as recited in this claim is deemed to be incomplete for omitting essential structural/functional cooperative relationships of elements, such omission amounting to a gap between the necessary structural/functional connections. In this regard it is noted that the disclosed and claimed invention recites the utility of providing the function/action of "programming an industrial robot to move relative to defined positions on an object", however the remainder of each of these claims, when taken as a whole,

fails to recite that the results of this claimed invention have been or are used to achieve the recited utility. In this regard it is noted that as under stood by one of ordinary skill at the time the invention was made, the limitations of the claims recite:

A) the claims recite a utility of "programming an industrial robot to move relative to defined positions on an object";

B) the first structure of claim 19 is directed to nothing more than an unspecified object;

C) the second structure of claim 19 is directed to nothing more than a robot that takes measurements of the surface of the first structure in a co-ordinate system associated with the robot;

D) the third structure of claim 19 is directed to nothing more than providing the function of manipulating data/information by determining the "orientation and position" of a model of the first structure relative to the number of measurement points on the surface of the first structure so as to map/align/correlate the measured points produced by the second structure to the corresponding points on the model of the first structure;

E) the fourth structure of claim 19 is directed to nothing more than providing the function of manipulating data/information by determining the positional error or deviation between the measured points produced by the second structure and the corresponding points on the model of the first structure;

F) the fifth structure of claim 19 is directed to nothing more than providing the function of manipulating data/information by adjusting one or more "defined positions" based on the determined positional error or deviation between the measured points produced by the second structure and the corresponding points on the model of the first structure; and

F) the subject matter of dependent claims 20, 21, 24 & 26-29 is directed to nothing more than merely defining the nature of (1) the type of information/data to be processed by the claimed invention, and/or (2) the type of information/data processing performed by the claimed invention, and/or (3) the structure or device used to make the measurements of the claimed invention, with out associating the subject matter recited in these claims to something that one of ordinary skill at the time the invention was made

would recognize as achieving the recited utility of programming an industrial robot to move relative to defined positions on an object.

Where, it is noted that taking the claim as a whole the functions/acts that are recited as the invention do not explicitly or inherently convey to one of ordinary skill at the time of the invention that the claimed machine would fulfill the function of "programming an industrial robot to move relative to defined positions on an object" since these claims fail to required that either the "determined positional errors/deviations" or the adjusted "defined positions" be used to modify the control program for the "industrial robot" in a manner that would be recognized by one of ordinary skill at the time the invention was made as achieving the disclosed and claimed utility of "programming an industrial robot to move relative to defined positions on an object".

7.3   In regard to claims 22, 23 & 25, the claimed invention as recited in this claim is deemed to be incomplete for omitting essential structural/functional cooperative relationships of elements, such omission amounting to a gap between the necessary structural/functional connections. In this regard it is noted that the disclosed and claimed invention recites the use of "measuring points" to perform various functions however, neither base claim 22 nor dependent claims 23 & 25 recite that any "measuring points" have been acquired and hence it is unclear how the recited "measuring points" can be used as recited in these claims.

7.4   Appropriate correction is required.

8.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

         The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8.1   Claims 22, 23 & 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8.1.1   In regard to claim 22, it is noted that as amended, the preamble of this claim reads as "The system according to further comprising:", which implies that this claim is a dependent claim. However, since this claim does not in fact refer to any other previous claim it appears to be an independent claim. In view of the above, the nature of this claim is confusing and the scope of this claim cannot be properly determined.

8.2   Claims not explicitly mentioned above include the above noted defect(s) because the unmentioned claims are depend either directly or indirectly from one or more of the above noted claim(s).

9.   35 U.S.C. 101 reads as follows:

>   Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9.1   Claims 1-18, 22, 23 & 25 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

9.1.1   During the following analysis the following principles have been applied:

>   A) the limitations of the specification may not be read into the claims, "We are not persuaded by any sound reason why, at any time before the patent is granted, an applicant should have limitations of the specification read into a claim where no express statement of the limitation is included in the claim.", In re PRATER AND WEI, 162 USPQ 541 at 551 (CCPA 1969), where the language and meaning of the limitations of the claims is to be interpreted in a manner that is consistent with how one of ordinary would understand the meanings of the limitations, In re CORTRIGHT, 165 F.3d 1353, 1359, 49 USPQ2d 1464, 1468 (Fed. Cir. 1999), while (1) taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in applicant's specification, In re MORRIS, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997);

>   B) when interpreting the claims in the above manner, it is noted that the Court has addressed the nature of statutory subject matter under 35 U.S.C. 101. Where the Court has had the following to say:

>   (1) In DIAMOND v. DIEHR AND LUTTON, 209 USPQ 1 (US SupCT, 1981) the U.S. Supreme Court held that: (A) any thing under the sum made by man may constitute statutory subject matter under 35 U.S.C. 101, at page 6; (B) there is subject matter that is excluded, such as laws of nature, physical phenomena, and abstract ideas; idea of itself is not patentable, at page 8; (C) a claim that is directed to nothing more that the manipulation of data with or with

out the use of a mathematical formula is considered to be directed to a nonstatutory idea GOTTSCHALK v BENSON ET AL, 175 USPQ 673 (US SupCT, 1972) and PARKER v FLOOK, 198 USPQ 193 (US SupCT, 1978), at pages 7-8; and (D) a claim that is directed to a significant application of the manipulation of data, that is the idea, whether or not the manipulation include the use of mathematics, may be directed to statutory subject matter, at page 11.

(2) Further, the CAFC, following the suggestion of the Supreme Court, in In re WARMERDAM, 31 USPQ2d 1745 at 1758-1759 (CAFC, 1994) and in STATE STREET BANK AND TRUST CO. v SIGNATURE FINANCIAL GROUP INC., 38 USPQ2d 1596 at 1602 (CAFC 1998) reinforced the idea that a claim which lacks an concrete, tangible and useful application of the results of the claimed manipulation of data/information does not go beyond the mere manipulation of data even though there may be a suggestion of physical acts, and hence such a claim is unpatentable as being directed to an idea which has been held to be non-statutory subject matter of under 35 U.S.C. 101.

(3) Whereas the Court has afforded some guidance as to what would be deemed to be a concrete, tangible and useful application of the results of the claimed manipulation of data/information as the court in DIAMOND v. DIEHR AND LUTTON, supra at page 11, "We recognize, of course, that when a claim recites a mathematical formula (or scientific principle or phenomenon of nature), an inquiry must be made into whether the claim is seeking patent protection for that formula in the abstract. A mathematical formula as such is not accorded the protection of our patent laws, Gottschalk v. Benson, supra, and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment. Parker v. Flook, supra. Similarly, insignificant post-solution activity will not transform an unpatentable principle into a patentable process. Ibid. [14] To hold otherwise would allow a competent draftsman to evade the recognized limitations on the type of subject matter eligible for patent protection. On the other hand, when a claim containing a

mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect (e.g., transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of §101.".

(4) And the Court has provided some guidance on what would be deemed to be significant activity beyond the claimed manipulation of data/information, In re RICHMAN, 195 USPQ 340 at 344 (CCPA 1977) "In the present case too, notwithstanding that the antecedent steps are novel and unobvious, they merely determine values for the variables used in the mathematical formulae used in making the calculations. Thus, such antecedent steps do not suffice to render the claimed methods, considered as a whole, statutory subject matter. ... But if a claim is directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory.".

(5) Whereas, the Court has further noted that the form of a claim, that is machine or process or manufacture is an exercise in claim drafting and therefore is not determinative factor regarding whether or not the claim recites statutory subject matter, see In re MAUCORPS, 203 USPQ 812 @ 815-816 (CCPA 1979), "Labels are not determinative in §101 inquiries. "Benson applies equally whether an invention is claimed as an apparatus or process, because the form of the claim is often an exercise in drafting." In re JOHNSON, 589 F.2d 1070, 1077, 200 USPQ 199, 206 (CCPA 1978). "Though a claim expressed in 'means for' (functional) terms is said to be an apparatus claim, the subject matter as a whole of that claim may be indistinguishable from that of a method claim drawn to the steps performed by the 'means.'" In re FREEMAN, 573 F.2d at 1247, 197 USPQ at 472.".

C) taking the above Court decisions into consideration it can be seen that when a invention described as a machine, process or manufacture, can reasonably be interpreted by one of ordinary skill at the time of the invention as being directed to the manipulation

of data/information, then the claimed invention is directed to an non-statutory abstract idea.

9.1.2   It is noted that the disclosure presents a disclosed utility for the invention of:

A) process/method claims 1-17 as a process/method comprising a sequence of steps/functions/actions that when take as a whole provide the useful function of "programming an industrial robot to move relative to defined positions on an object";

B) machine/system/apparatus claims 22, 23 & 25 as a machine comprising one or more structures that when take as a whole achieve the useful function of mapping or correlating measurement data/information to model data/information; and

C) manufacture/article/item claim 18 as a manufacture defines an item by it's characteristics/features/components that when take as a whole define the manufacture to provide the useful function of "programming an industrial robot to move relative to defined positions on an object".

9.1.3   It is further noted that as recited in:

A) claims 1-17 when take as a whole are directed to a process/method to achieve the utility of determining adjustments to defined points on an object by determining the error/deviation between measurement data/information and the corresponding points on a model of an object;

B) claims 22, 23 & 25 when take as a whole are directed to a machine to achieve the claimed functions of classifying and identifying objects based on measurement data/information; and

C) claim 18 when take as a whole is directed to a manufacture/article/item to achieve the utility of determining adjustments to defined points on an object by determining the error/deviation between measurement data/information and the corresponding points on a model of an object.

9.1.4   In regard to each of the pending claims while taking each claim as a whole and interpreting the claims as set forth above, it is noted that one of ordinary skill at the time of the invention could reasonably make the following observations in regard to the interpretation of each of the pending claims

9.1.4.1 In regard to the recited utility of independent/base claims 1 & 17, it is noted that these claims recite an intended field of utility for the invention recited as a method in claims 1 & 17 and as an article/manufacture in claim 18 as set forth above.

9.1.4.2 In regard to the limitations of independent/base claims 1 & 17, it is noted that:

A) the first step/function/action of claims 1 & 17 is directed to nothing more than providing the function of acquiring/register a number of measurement points on the surface of an object in a co-ordinate system associated with the robot;

B) the second step/function/action of claims 1 & 17 is directed to nothing more than providing the function of manipulating data/information by determining the "orientation and position" of a model of the object relative to the number of measurement points on the surface of the object so as to map/align/correlate the measured points to the corresponding points on the model;

C) the third step/function/action of claims 1 & 17 is directed to nothing more than providing the function of manipulating data/information by determining the positional error or deviation between the measured points and the corresponding points on the model; and

D) the fourth step/function/action of claims 1 & 17 is directed to nothing more than providing the function of manipulating data/information by adjusting one or more "defined positions" based on the determined positional error or deviation between the measured points and the corresponding points on the model; and

Hence, one of ordinary skill at the time the invention was made could interpreted claims 1 & 17 when taken as a whole as being directed to nothing more than a machine/process for the manipulation of data/information with out a claimed application of the results of the manipulation or claimed requirement that any of the recited structure or acts/functions are present or performed for any purpose not related to the manipulation of data/information.

9.1.4.3 The subject matter recited as dependent claims 2-16 is deemed to be directed to nonfunctional descriptive material that does not go beyond merely defining: (A) the nature/source of the recited data/information that is to be used when performing the recited processing; and/or (B) functional descriptive material that does not go beyond defining the nature of the steps/functions/actions that are used when performing the recited processing of

data/information; and hence does not alter the statutory nature of the invention recited as the invention in the base claims.

9.1.4.4 In regard to the limitations of independent/base claim 22, it is noted that:

> A) the claims do not recite a utility;

> B) the first structure of claim 22 is directed to nothing more than providing the function of manipulating data/information by determining "characteristic parameters for number of parts" based on a model an object and to map/align/correlate the measured points to the corresponding points on the model of the object;

Hence, one of ordinary skill at the time the invention was made could interpreted claim 22 when taken as a whole as being directed to nothing more than a machine/process for the manipulation of data/information with out a claimed application of the results of the manipulation or claimed requirement that any of the recited structure or acts/functions are present or performed for any purpose not related to the manipulation of data/information.

9.1.4.5 The subject matter recited as dependent claims 23 & 25 is deemed to be directed to nonfunctional descriptive material that does not go beyond merely defining: (A) the nature/source of the recited data/information that is to be used when performing the recited processing; and/or (B) functional descriptive material that does not go beyond defining the nature of the steps/functions/actions that are used when performing the recited processing of data/information; and hence does not alter the statutory nature of the invention recited as the invention in the base claims.

9.1.5 In view of the above characterization of claims 1-17, 22, 23 & 25 it can clearly be seen that, as these claims would be reasonably interpreted by one of ordinary skill at the time the invention was made, as merely conveying to one of ordinary skill at the time the invention was made a description of an invention that does not go beyond the manipulation of data/information and therefor merely sets forth the abstract ideas of receiving and transforming data by processing/manipulating the data/information into other data/information, for example transforming numbers to numbers without:

> A) requiring by explicitly reciting and achieving a claimed requirement that the results of the claimed invention be tangibly used in anyway by anyone or anything in order to achieve either:

(1) a concrete and tangible useful result; or

(2) a concrete and tangible useful practical application of either:

(1) the recited mathematical processing; or

(2) the resultant numbers/data produced by the claimed invention;

or

B) reciting and achieving a physical transformation of one thing into something else.

Such a claimed invention consisting solely of data collection and processing/manipulating data/information, whether it is drafted as a machine or process, is deemed to be directed to an attempt by applicant to patent an abstract idea of processing/manipulating data/information which would preempt all uses of the processing recited as the claimed invention and therefore as set forth by the Court the claimed invention is deemed to be directed to non-statutory subject matter, see either (A) DIAMOND v. DIEHR AND LUTTON, supra, citing GOTTSCHALK v BENSON ET AL, supra, and PARKER v FLOOK, supra; or (B) In re WARMERDAM, supra; or (C) STATE STREET BANK AND TRUST CO. v SIGNATURE FINANCIAL GROUP INC., supra; or (D) In re RICHMAN, supra, or (E) In re MAUCORPS, supra, citing both In re JOHNSON, supra, and In re FREEMAN, supra. Note also "Thus, a process consisting solely of mathematical operations, i.e., converting one set of numbers into another set of numbers, does not manipulate appropriate subject matter and thus cannot constitute a statutory process. In practical terms, claims define nonstatutory processes if they: – consist solely of mathematical operations without some claimed practical application (i.e., executing a "mathematical algorithm"); or – simply manipulate abstract ideas, e.g., a bid (Schrader, 22 F.3d at 293-94, 30 USPQ2d at 1458-59) or a bubble hierarchy (Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759), without some claimed practical application." MPEP 2106.

9.2   Claims 17 & 18 are rejected under 35 U.S.C. 101 because the claimed invention lacks utility and therefore is directed to non-statutory subject matter.

9.2.1   During the following analysis the following principles have been applied:

A) the limitations of the specification may not be read into the claims, "We are not persuaded by any sound reason why, at any time before the patent is granted, an applicant should have limitations of the specification read into a claim where no express

statement of the limitation is included in the claim.", In re PRATER AND WEI, 162 USPQ 541 at 551 (CCPA 1969); and

B) that a computer readable media containing data/information that would cause a useful function to be performed when claimed in conduction with a computer in such a manner that the functionality recited as the invention can be realized are statutory, see MPEP 2106(IV)(B)(1)(a) and In re BEAUREGARD, 35 USPQ2d 1383 (CAFC 1995), and note the corresponding claims of Beauregard et al (5,7010,578); and

C) that data structures by definition are not programs, "(The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).)", see also MPEP 2106(IV)(B)(1); and

D) concerning statutory subject matter, as set forth in the following quote, the computer program running on a computer makes the computer a different machine, see In re ALAPPAT, 31 USPQ2d 1545 at 1558 (CAFC 1994), "We have held that such programming creates a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software."; and

E) methods of operating a computer are statutory unless they fall in to judicially exceptions, see In re CHATFIELD, 191 USPQ 730 @ 736 (CCPA 1976) "Because Chatfield's claim 1 defines the invention as a "method of operating a computing system upon more than one processing program * * * comprising," the claim prima facie is directed to a "method" and the wording of the claim would bring it within the statutorily defined "process" category. However, a claim to a "method" or "process" may fall within the literal terms of the statute and yet not define proper subject matter for patent protection. Benson and Christensen, supra. The question is whether the claimed method falls within either of two categories judicially determined to be non-statutory ....."; and

F) that a computer program is not a statutory process since the program alone can not bring about a useful result with out being claim as being executed by a computer, see MPEP 2106(IV)(B)(1)(a); and

G) that nonfunctional data stored in a memory device is non-statutory, see "When nonfunctional descriptive material is recorded on some computer-readable medium, it is not statutory since no requisite functionality is present to satisfy the practical application requirement. Merely claiming nonfunctional descriptive material stored in a computer-readable medium does not make it statutory. Such a result would exalt form over substance. In re SARKAR, 588 F.2d 1330, 1333, 200 USPQ 132, 137 (CCPA 1978)".

9.2.2   It is noted that:

A) claim 18 is directed to a manufacture/article/item that defines an item by it's characteristics/features/components that when take as a whole define the manufacture/article/item.

B) claim 17 is directed to a "program" or "code" per se as set forth by applicant in the preamble and hence these claims recite steps/functions/actions that when take as a whole do not define either a process, see MPEP 2106(IV)(B)(1)(a), and In re CHATFIELD, supra, or a machine, see In re ALAPPAT, supra.

9.2.3   It is further noted that:

A) claim 18 when take as a whole is directed to a manufacture/article/item to achieve the claimed utility of producing a calibrated/compensated/corrected sequence of control instructions from a series of measurements on models so as to make a computer controlled device perform a task.

B) claim 17 when take as a whole are directed to a program or process/method that does not achieve the claimed utility of producing a calibrated/compensated/corrected sequence of control instructions from a series of measurements on models so as to make a computer controlled device perform a task since as one of ordinary skill at the time the invention was made would recognize these claims fail to recite the structure that would be necessary to implement the functions of the recited "program" or "code" so as to achieve the disclosed and recited utility of the claimed invention.

9.2.4   In regard to each of the pending claims taking each claim as a whole and interpreting the claims as set forth above, one of ordinary skill at the time of the invention would make the following observations in regard each of the limitations of the claims:

A) the claims recite a utility of "a program" or "a code" or "instructions" in claim 17 and "a manufacture" claim 18 for producing a calibrated/compensated/corrected sequence of control instructions from a series of measurements on models so as to make a computer controlled device perform a task;

B) machine/process/article of claim 18 recites an intended field of use of "producing a calibrated/compensated/corrected sequence of control instructions from a series of measurements on models so as to make a computer controlled device perform a task" but fails to recite a limitation that would require the operation of the machine/process is in anyway affected by the claimed functions of article of claim 18;

C) in regard to the body of claims 17 & 18, as recited in these claims applicant has:

(1) set forth a "software program" or "code" or "a manufacture" in claim 17 and an article in claim 18 comprising "computer program for" or "code for" or "instructions for" performing one or more functions associated with the functions of producing a calibrated/compensated/corrected sequence of control instructions from a series of measurements on models so as to make a computer controlled device perform a task; and

(2) failed to set forth either (a) a specific machine that is operates in a specific manner by executing the recited "program" or "codes" so as to produce a new machine, see In re ALAPPAT, supra, or (b) a process of operating a machine to perform the recited functions of the "program" or "code", see In re CHATFIELD, supra, and

D) neither (1) the data/information that represents either the "computer program for" or "code for" or "instructions for"; nor (2) the computer readable media or memory device alone, which applicant has recited as the claimed invention, can not produce a concretely and tangibly result that would be required for the recited functionality of the claimed invention.

Hence, as one of ordinary skill at the time the invention was made would recognize, the language of the claims merely recites functions that the program/code or data/information is intended to accomplish as the invention but fails to recite any limitation that would permit the functionality

of the recited program/code or data/information to produce the required concrete and tangible result. Therefore, one of ordinary skill at the time the invention was made would recognize the recited functional language of the claims as being non functional descriptive material/data/information upon which patentability can not be based, "Cf. In re GULACK, 703 F.2d 1381, 1385, 217 USPQ 401, 404 (Fed. Cir. 1983) (when descriptive material is not functionally related to the substrate, the descriptive material will not distinguish the invention from the prior art in terms of patentability). Common situations involving nonfunctional descriptive material are: ... - a computer that differs from the prior art solely with respect to nonfunctional descriptive material that cannot alter how the machine functions (i.e., the descriptive material does not reconfigure the computer), or - a process that differs from the prior art only with respect to nonfunctional descriptive material that cannot alter how the process steps are to be performed to achieve the utility of the invention. Thus, if the prior art suggests storing a song on a disk, merely choosing a particular song to store on the disk would be presumed to be well within the level of ordinary skill in the art at the time the invention was made. The difference between the prior art and the claimed invention is simply a rearrangement of nonfunctional descriptive material." MPEP 2106.

9.2.5   In view of the above characterization of claims 17 & 18 it can clearly be seen that, as these claims would be reasonably interpreted by one of ordinary skill at the time the invention was made, these claims merely convey to one of ordinary skill at the time the invention was made a description of an invention that merely sets forth the concept of data/information that is a program/code/instructions as non functional data/information that may be contain with in or on a memory/manufacture/article, where the recited memory/manufacture/article alone, that is by itself, can not realize the disclosed and claimed utility as set forth by applicant.

9.2.6   Such a claimed invention as recited in the claims, as would be recognized by one of ordinary skill at the time the invention was made, as describing a claimed invention that is not operative to achieve the disclosed or claimed practical and substantial utility of "producing a calibrated/compensated/corrected sequence of control instructions from a series of measurements on models so as to make a computer controlled device perform a task" as applicant has set forth and has been by the court to be non-statutory subject matter, see In re SARKAR, supra.

10.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10.1   Claims 1, 6, 9-22, 26 & 29-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Graham et al (6,256,546).

10.1.1 In regard to claims 1, 6, 9-22, 26 & 29-36, Graham et al ('546) discloses a computer implemented process/machine that under the control of an operating program stored in a computer accessible storage device provides the function of improving the processing of workpieces, that is objects, by an industrial robot. To this end Graham et al ('546) discloses a machine/process in which the control program for a machine/process is modified to increase the accuracy of a machine/process by removing positional errors. To remove the positional errors, the machine/process through the use of a surface scanning program is commanded to move to a number of designated measurement positions/locations on an object. At each measurement position/location from the starting position/location until the ending position/location, the position of the machine relative to the co-ordinate system of the machine/process is sensed/determined by using an appropriate measuring device/machine and then recorded. Next, for each measurement position/location the measurement position/location and it's associated co-ordinates are correlated to a model of the object by mapping each measure position to the corresponding position/location on the nominal model of the object. After performing this mapping, then the positional error/deviation between the co-ordinates of each measurement position/location and the corresponding position/location on the model is determined and optimized. Finally, each of the designated positions of the machine/process that are contained in the control program for the machine/process is modified based on the determined positional error/deviation so that the machine/process may be controlled more accurately to designated positions/locations. See figures 2 & 5 with their associated descriptions.

10.1.2 In regard to claims 17 & 18, it is further noted that the combination of the operating program that is stored with in the memory of the machine/process of Graham et al ('546) and

controls the operation of the machine/process of Graham et al ('546) would be recognized by one of ordinary skill at the time the invention was made as the invention recited in these claims.

11.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11.1   Claims 7, 8, 27 & 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graham et al (6,256,546) as applied above to claims 1, 6, 9-22, 26 & 29-36 and further in view of obvious requirements.

11.1.1 In regard to claims 7, 8, 27 & 28, Graham et al ('546) does not disclose that the surface of the object/part is subdivided into multiple subsurfaces or the use of multiple line segments for edges. However, it is noted that in a 3 (three) dimensional world all objects would have a length, width and height/thickness that would provide at lest three subsurfaces. The subsurfaces of an object would include a top subsurface, a bottom subsurface and at least 1 (one) edge/side subsurface for a cylinder, or 3 (three) exterior edges/sides or subsurfaces for a triangular shape or at lest 4 (four) exterior edges/sides or subsurfaces for a polygonal shape. The fact that an object would have multiple subsurfaces is evidenced by workpiece or object 55 as in figure 8 of Graham et al ('546), where object 55 has a top/upper surface, a bottom/lower surface and an exterior cylindrical surface in to which tool 58 is to machine a series of holes 60. Further, since as disclosed by Graham et al ('546) neither part 11 not object 55 have fixed dimensions/size and the function of Graham et al ('546) is to more accurately machine an object, it would have been obvious to one of ordinary skill at the time the invention was made that the positional error/deviation correction process of Graham et al ('546) would include the use of at least one measuring point on each subsurface of the object in order to accurately and properly correct/compensated for each of the various potential subsurfaces and/or edges of the object while performing the process of correcting for positional errors/deviations of the machine

12.   The following is a statement of reasons for the indication of allowable subject matter:

        A) however, the prior art does not fairly teach or suggest in regard to claims 2, 4, 22 (with the assumption that claim 22 depends from claim 19) & 24, using calculated parameters for a number of models/parts/objects and the measurement points to determine to which part of the model a measuring point belongs as part of the function of adapting/correlating the measuring point and the model.   Claims 3, 5, 23, 25 are allowable over the prior art for the same reason.

13.   The examiner has cited prior art of interest, for example:

        A) Lippel (2,927,258) discloses a machine/process in which a operating program is used to drive a machine tool to a number of predetermined points on a workpeice or object, where the predetermined points on the workpeice are defined in a co-ordinate system for the machine relative to a known or fixed position, and where these machines/process are susceptible to positional errors between the actual location of the tool and the commanded position of the tool.

        B) Devol et al (3,543,910) discloses a machine/process in which an operating program is used to drive a robot to a number of predetermined points with in the robot's workspace, where the robot may include a number of different tools.

        C) Okada et al (4,670,849) discloses a machine/process in which the control program for a machine/process is modified to increase the accuracy of a machine/process by removing positional errors. To remove the positional errors, the machine/process is commanded to move to a number of designated measurement positions/locations. At each measurement position/location, the position of the machine relative to the co-ordinate system (CO1) of the machine/process for each measurement point are determined and recorded. Further, during each measurement the absolute co-ordinates of the machine relative to a co-ordinate system (CO2) are also determined and recorded. Next, a positional error for each measurement position/location is determined based on a comparison of the acquired positional measurements for both co-ordinate systems CO1 and CO2. Finally, the designated commanded position/location of the machine/process that is contained in the control program is modified based on the determined positional

error so that the machine/process may be controlled more accurately to designated positions/locations.

D) Lyons et al (2003/0085891) discloses that a computer models of a multiple surface object may be formed by aligning and mapping a number of images taken from different positions after having determined the co-ordinates form which each image was taken and mapping/transforming the multiple images onto a single object.

F) Nagata et al (JP 2003-211376 A) disclose a machine/process in which the error or deviation between a commanded position and the actual measured position of a machine is used to develop control signals that will tend to reduce/minimize the determined error/deviation.

G) either Bischoff (2005/0273202) or Nagatsuka et al (2006/0025890) with an effective data after 17 December 2003 disclose a machine/process in which measured co-ordinate data for an object is combined with model data for the object in order to determine the positional errors that are used to correct a control program for the machine/process so that the machine/process will be more accurate.

14.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edward R. Cosimano whose telephone number is 571-272-0571. The examiner can normally be reached on 571-272-0571 from 7:30am to 4:00pm (Eastern time).

14.1   If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow, can be reached on 571-272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

14.2   Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ERC
08/24/2006

Edward Cosimano
Primary Examiner